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Geoglossaceous fungi in Slovakia 5. *Geoglossum uliginosum*: taxonomy and nomenclature

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Abstract — *Geoglossum uliginosum* is a new record for Slovakia and second record for Central Europe. *Geoglossum glabrum* var. *uliginosum* is a forgotten and disused name representing a different fungus with unknown circumscription. Recent collections of *G. uliginosum* from Slovakia are described and compared with the Swedish holotype and the Czech collections, and the nomenclature and distribution of the species are discussed.

Key words — *Geoglossaceae*, Scandinavia, conservation

Introduction

During field research of geoglossaceous fungi in non-forested stands in Slovakia, an interesting species of *Geoglossum* was collected and identified as *Geoglossum uliginosum*. Although collections from the Czech Republic have already been published (Kučera & Gaisler 2012), the Slovak specimens were collected and identified first. *Geoglossum* species are rare in Slovakia, and only a few taxa had been reported before 2000 when we started our research (Kučera et al. 2008, 2010, 2012; Kučera 2012). Geoglossaceous fungi, which have been used in studies evaluating European grasslands (Rald 1985; Nitare 1988; Jordal 1997; McHugh et al. 2001; Adamčík & Kautmanová 2005), are of conservation interest. In Sweden, *Geoglossum uliginosum* is treated in a special 'action plan' for nature conservation (Nitare 2007).

Materials & methods

Macromorphological characters were observed in fresh material. The micromorphological structures were observed in dried material using a light microscope

with an oil immersion lens. Fragments of fruit-bodies were examined in tap water, 5% KOH, Melzer's reagent, and a solution of Congo red in ammonia. Quantitative values for micromorphological characters are presented as mean ± 1 standard deviation of 30 measurements for each character (with minimum/maximum values in parentheses). Herbarium acronyms are in accordance with Index Herbariorum (Thiers 2013). Voucher specimens were deposited in herbaria PRM, BRNM, SAV, and UPS. Localities are georeferenced and the coordinates are given in the WGS 84 system. The description is based on collections from Slovakia.

Description of studied Slovak collections

Geoglossum uliginosum Hakelier, Svensk Bot. Tidskr. 61: 422, 1967.

Ascocarps (35–)38–58(–66) mm high, clavate, stipitate, scattered, solitary. Fertile part (10–)14–22(–25) × (2–)3–6(–8) mm, usually flattened, lanceolate, black, occasionally vertically grooved, glabrous. Sterile part 20–40(–50) × 1–3 mm, clearly delimited from the fertile part, cylindrical, black, smooth, viscid when fresh, ± shiny after drying [22 fruitbodies examined]. Asci (143–)156–189(–214) × (11–)15–20(–24) µm, clavate, apex rounded, narrowed, 8-spored, pore blued in Melzer's reagent. Spores (48–)59–75(–80) × 4–5(–6) µm, cylindrical, slightly curved, tapering towards one end, dark fuliginous, in one cluster in the upper part of the ascus, 7-septate, occasionally 5- or 6-septate. Paraphyses slightly protruding above the asci, fragile, brownish in the apical part, ≤9 µm diam, remotely septate in the basal portion, closely septate in the apical part, constricted at the septa. The constrictions occur at every second septum. The cell pairs form chains and are easily broken off at the constrictions. One of the cell pairs may be inflated to pyriform or globular form, ≤6–8 µm diam, especially in the apical part of the paraphyses. Instructive drawings of paraphyses (and asci and spores) taken from the holotype specimen were published by Nitare (2007).

Habitat — Peat-bogs and wet meadows in association with *Sphagnum* sp., *Eriophorum* sp., *Deschampsia caespitosa, Nardus* sp., *Molinia caerulea,* and various species of *Carex*.

Distribution — Czech Republic (Kučera & Gaisler 2012), Norway (Fadnes 2008; Nitare 2007), Slovakia (this paper), Sweden (Hakelier 1967; Nitare 1984, 2007; Ohenoja 2000, Turander 2012). Reports from Scotland and Northern Ireland probably relate to a different species (Nitare 2007).

Specimens studied: **SWEDEN**, **Västmanland**, Viker parish, Älvhyttan, Venen, 11.9.1965, N. Hakelier (holotype, UPS BOT: F-013939). **SLOVAKIA**, **Banská Bystrica,** Poľana Mts., Hriňová, near mountain hotel "Poľana", along the trail to the top of the Poľana hill, 48°37′39.73″N 19°28′01″E, alt. 1304 m, wet meadow with *Deschampsia caespitosa, Eriophorum* sp., *Sphagnum* sp. 27.9.2009, V. Kučera (SAV F–10162); 6.10.2011, V. Kučera (SAV F–10529).

Discussion

Nomenclature — The name *Geoglossum uliginosum* could potentially be confused with *G. glabrum* [var.] β *uliginosum* Pers. (Persoon 1800: 62, tab. 3 fig. 4). As Persoon's name was apparently never raised to specific rank, however, Hakelier's name is legitimate and not in conflict. *G. glabrum* var. *uliginosum* certainly represents a different taxon because it was described as having a squamulose stipe, while that of *G. uliginosum* is completely smooth. We were unable to locate any specimen labelled either *Geoglossum glabrum* var./f. *uliginosum* or *Geoglossum uliginosum* in Persoon's herbarium (L), and identification of Persoon's fungus based only on the original (sparse) description is impossible.

Taxonomy — *Geoglossum uliginosum* is characterised by having 1) ascocarps with a slightly slimy-viscid stipe and 2) paraphyses with characteristically long and easily broken chains of cells (or cell pairs) that are swollen at one or sometimes both ends. The species grows only in slightly wet grasslands among *Sphagnum*. The material from Central Europe (both from Slovak and Czech Rpublics) does not differ in any essential character from the holotype and other Swedish collections; minor differences are presented in Table 1.

Table 1. Comparison of asci and ascospores in *Geoglossum uliginosum* from different countries.

Country	Asci (µm)		Ascospores (µm)		No. of septa
	Length	Width	Length	Width	
Slovakia	(143–)156–189(–214)	(11–)15–20(–24)	(48–)59–75(–80)	4–5(–6)	(5–)7
Czech Republic	(151–)167–190(–196)	(13–)15–19(–24)	(50–)63–78(–90)	5–7	(5–)7(–9)
Sweden	140–175	14.5–17	60–80	4.5–6	7

Specimen data: Slovakia — SAV F-10162, SAV F-10529; Czech Republic — PRM 860478, PRM 860479, PRM 860480, BRNM 737698, BRNM 737699, SAV F-10531, SAV F-10532 (see Kučera & Gaisler 2012); Sweden — Holotype UPS BOT F-013939 (Hakelier 1967).

Conservation — *Geoglossum uliginosum* is well known from Scandinavia (Sweden and Norway) and it was assumed that its distribution is restricted to slightly wet and unfertilised semi-natural grasslands in the hemiboreal and southern boreal vegetation zons in Scandinavia (Nitare 2007). Records from Central Europe are therefore noteworthy.

We expect to find *Geoglossum uliginosum* in other locations in Central Europe with habitats similar to those in Poľana and Jizerské hory mountains. The species is apparently rare and should be included in the next edition of the Red list of Slovakia and Red list of Czech Republic. Currently the species is red-listed in Sweden (Gärdenfors 2010).

Semi-natural grasslands are valuable landscape elements with high diversity of plant and animal life and represent a reservoir of indigenous biodiversity. Such habitats are critically threatened all over Europe, their number decreasing mainly due to the fertilization, lack of grazing animals, and industrial pollution (Newton et al. 2003).

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Literature cited

Adamčík S., Kautmanová I. 2005. *Hygrocybe* species as indicators of natural value of grasslands in Slovakia. Catathelasma 6: 25–34.

Fadnes P. 2008. Kartlegging av sopfloraen i noen naturbeitemarker i Karmøy kommune 2008 HSH rapport- 2/2008. [accessed 11-6-2012: http://brage.bibsys.no/hsh/bitstream/URN:NBN:no-bibsys_brage_11012/1/fadnes.pdf].

Gärdenfors U. (ed.) 2010. Rödlistade arter i Sverige 2010 – The 2010 Redlist of Swedish species. Uppsala.

Hakelier N. 1967. Three new Swedish species of *Geoglossum*. Svensk Bot. Tidskr. 61: 419–424.

Jordal JB. 1997. Sopp i naturbeitemarker i Norge: en kunnskapsstatus over utbredelse, okologi, indikatorverdi og trusler i et europeisk perspektiv. Trondheim.

Kučera V. 2012. Geoglossaceous fungi in Slovakia IV. *Geoglossum alveolatum,* a new species for the country. Catathelasma 14: 11–14.

Kučera V, Gaisler J. 2012. First record of *Geoglossum uliginosum* (*Ascomycota, Geoglossales*) in the Czech Republic, Czech Mycol. 64: 135–140.

Kučera V, Lizoň P. 2012. Geoglossaceous fungi in Slovakia III. The genus *Geoglossum*, Biologia 67: 654—658, http://dx.doi.org/10.2478/s11756-012-0053-6

Kučera V, Lizoň P, Kautmanová I. 2008. Geoglossaceous fungi in Slovakia: rare and new taxa for the territory. Biologia 63: 482–486. http://dx.doi.org/10.2478/s11756-008-0077-0

Kučera V, Lizoň P, Kautmanová I. 2010. Geoglossoid fungi in Slovakia II. *Trichoglossum octopartitum*, a new species for the country. Czech Mycol. 62: 13–18.

McHugh R, Mitchel D, Wright M, Anderson R. 2001. The fungi of Irish grasslands and their value for nature conservation. Biol. Environm., Proc. Roy. Irish Acad. 101B: 225–242.

Newton AC, Davy LM, Holden E, Silverside A, Watling R, Ward SD. 2003. Status, distribution and definition of mycologically important grasslands in Scotland. Biol. Conserv. 111: 11–23. http://dx.doi.org/10.1016/S0006-3207(02)00243-4

Nitare J. 1984. Kartor aver kända fynd av svarta jordtungor i Sverige. Windahlia 14: 78–94.

Nitare J. 1988. Jordtungor, en svampgrupp påtillbakagång i naturliga fodermarker. Svensk Bot. Tidskr. 82: 341–368.

Nitare J. 2007. Åtgärdsprogram för sumpjordtunga 2007–2011 *Geoglossum uliginosum*. http://www.naturvardsverket.se/Documents/publikationer/620-5734-0.pdf [accessed 11-6-2012]

Ohenoja E. 2000. *Geoglossaceae* Corda. 177–183, in: L Hansen, H Knudsen. (eds), Nordic Macromycetes, vol. 1. Copenhagen.

Persoon CH. 1800 ["1799"]. Observationes mycologicae, vol. 2. Leipzig.

Rald E. 1985. Voxhatte som indikatorarter for mykologisk vardifulde overdrevslokaliteter. Svampe 11: 1–9.

Thiers B. 2013 [continuously updated]. Index Herbariorum: a global directory of public herbaria and associated staff. New York Botanical Garden's Virtual Herbarium [accessed 11-3-2013: http://sweetgum.nybg.org/ih/].

Turander F. 2012. Sumpjordtunga (*Geoglossum uliginosum*) och andra jordtungor på Malmbackarna i Värmland. Svensk Mykol. Tidskr. 33: 16–20.